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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Lars Johan Persson

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EXAMINER

GANDHI, DIPAKKUMAR B

ART UNIT

PAPER NUMBER

2138

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.		Applicant(s)	
	09/817,731		PERSSON ET AL.	
	Examiner		Art Unit	
	Dipakkumar Gandhi		2138	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) 1-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


GUY LAMARRE
PRIMARY EXAMINER

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Response to Amendment

1. Applicants' request for reconsideration filed on 12/12/2006 has been reviewed.
2. Amendment filed on 12/12/2006 has been entered.
3. Applicants' arguments filed on 12/12/2006 have been fully considered but they are not persuasive.
4. The applicants contend, "As per claim 41, the references fail to disclose or suggest determining that an effective signal strength of a signal on a wireless communication link using signal diversity in one or more of the space, time, or frequency domains is insufficient to provide a desired communication range and introducing signal diversity in an additional of the space, time, or frequency domains into the wireless communication link in response to the determining".

The examiner disagrees and would like to point out that Lundby et al. teach that antenna transmit diversity as well as multi-carrier transmission are promising new technologies that improve transmission resistance to fading by offering space and/or frequency diversity (col. 3, lines 21-24, Lundby et al.).

Lundby et al. also teach that many techniques have been proposed for mitigating mutual interference between signals transmitted from the different antennas. Such techniques include delay transmit diversity, orthogonal transmit diversity (OTD), time switched transmit diversity (TSTD), time delayed transmit diversity (TDTD), and multi-carrier transmit diversity (MCTD). Each of these methods shares with the others a common goal of providing additional diversity in the transmitted signal through space, time, frequency or code space. These methods are known in the art and have been described in proposals to the International Telecommunications Union in response to their request for proposed Third Generation Wireless communication systems. Methods for introducing diversity into a transmitted signal are almost limitless by their very nature. Copending U.S. Pat. No. 6,215,777 entitled "Method and Apparatus for Transmitting and Receiving Data Multiplexed onto Multiple Code Channels, Frequencies and Base Stations", filed Sep. 15, 1997, assigned to the assignee of the present invention and incorporated by reference herein, describes a matrix of methods for transmitting CDMA signals using multiple carriers and multiple code channels for introducing diversity into the transmitted signal (col. 3, lines 28-50, Lundby et al.). Thus Lundby et al. teach determining that the transmission signals are faded

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(i.e. effective signal strength is insufficient to provide a desired communication range) and determining mutual interference between signals transmitted from the different antennas (i.e. the communication link is already using diversity).

5. The applicants contend, "As per claim 41, the diversity schemes in the cited references is fixed." The examiner disagrees and would like to point out that Lundby et al. teach that methods for introducing diversity into a transmitted signal are almost limitless by their very nature (col. 3, lines 40-42, Lundby et al.)

6. The applicants contend, "As per claim 42 and claim 55, Lundby and Anvari fail to disclose or suggest introducing additional diversity on a wireless communication link that is using diversity. Claim 55 includes similar limitations, and the discussion of claim 42 applies equally to claim 55."

The examiner disagrees; please see the arguments for claim 41 above.

7. The applicants contend, "As per claim 42, the references fail to disclose or suggest introducing diversity into a signal that has a level of diversity and an existing diversity scheme is dynamically changed."

The examiner disagrees and would like to point out that Lundby et al. teach that many techniques have been proposed for mitigating mutual interference between signals transmitted from the different antennas. Such techniques include delay transmit diversity, orthogonal transmit diversity (OTD), time switched transmit diversity (TSTD), time delayed transmit diversity (TDTD), and multi-carrier transmit diversity (MCTD). Each of these methods shares with the others a common goal of providing additional diversity in the transmitted signal through space, time, frequency or code space. These methods are known in the art and have been described in proposals to the International Telecommunications Union in response to their request for proposed Third Generation Wireless communication systems. Methods for introducing diversity into a transmitted signal are almost limitless by their very nature (col. 3, lines 28-42, Lundby et al.).

8. The applicants contend, "Claims 55, 58, and 67 are independent and recite limitations similarly directed to the limitations of introducing additional diversity in a communication link having a level of

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diversity. The discussion above of the deficiencies of Lundby, Anvari and Tsujimoto applies to claims 55, 58, and 67."

The examiner disagrees; please see the arguments for claim 41 and claim 42 above.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646). Please see the office action mailed on 09/08/2006 for details.

12. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646) and Tsujimoto (US 5,369,412). Please see the office action mailed on 09/08/2006 for details.

13. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and further in view of Worthy (US 6,643,494 B1). Please see the office action mailed on 09/08/2006 for details.

14. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and

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further in view of Molloy et al. (US 6,591,382 B1). Please see the office action mailed on 09/08/2006 for details.

15. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 44 above, and further in view of Agrawal et al. (US 5,722,051). Please see the office action mailed on 09/08/2006 for details.

16. Claims 46, 47, 48, 49, 50, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646) and Tsujimoto (US 5,369,412) as applied to claim 42 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 09/08/2006 for details.

17. Claims 52, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412), Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1) as applied to claim 50 above, and further in view of Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105). Please see the office action mailed on 09/08/2006 for details.

18. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412), Chuang et al. (US 6,052,594), Schuster et al. (US 6,170,075 B1), Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105) as applied to claim 52 above, and further in view of Chin et al. (US 6,694,155 B1). Please see the office action mailed on 09/08/2006 for details.

19. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349). Please see the office action mailed on 09/08/2006 for details.

20. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349) as applied to claim 55 above, and further in view of Molloy et al. (US 6,591,382 B1) and Agrawal et al. (US 5,722,051). Please see the office action mailed on 09/08/2006 for details.

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21. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Tolopka et al. (US 6,044,349) as applied to claim 55 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 09/08/2006 for details.

22. Claims 58, 59, 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1). Please see the office action mailed on 09/08/2006 for details.

23. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 58 above, and further in view of Agrawal et al. (US 5,722,051). Please see the office action mailed on 09/08/2006 for details.

24. Claims 61, 62, 63, 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1) as applied to claim 58 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 09/08/2006 for details.

25. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1), Anvari (US 5,461,646), Tsujimoto (US 5,369,412) and Molloy et al. (US 6,591,382 B1), Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1) as applied to claim 64 above, and further in view of Altman et al. (US 3,195,049) and Balachandran et al. (US 5,881,105). Please see the office action mailed on 09/08/2006 for details.

26. Claims 67, 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) in view of Anvari (US 5,461,646). Please see the office action mailed on 09/08/2006 for details.

27. Claim 68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) and Anvari (US 5,461,646) as applied to claim 67 above, and further in view of Worthy (US 6,643,494 B1). Please see the office action mailed on 09/08/2006 for details.

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28. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) and Anvari (US 5,461,646) as applied to claim 67 above, and further in view of Molloy et al. (US 6,591,382 B1) and Agrawal et al. (US 5,722,051). Please see the office action mailed on 09/08/2006 for details.

29. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundby et al. (US 6,356,528 B1) and Anvari (US 5,461,646) as applied to claim 67 above, and further in view of Chuang et al. (US 6,052,594) and Schuster et al. (US 6,170,075 B1). Please see the office action mailed on 09/08/2006 for details.

Conclusion

30. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 571-272-3822. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Dipakkumar Gandhi
Patent Examiner